

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (currently amended) A method facilitating bandwidth management across a plurality of access links, comprising

monitoring ~~bandwidth utilization the data throughput~~ at a plurality of interfaces in at least one routing system, wherein the plurality of interfaces are operably connected to respective access links;

~~selecting an interface of the plurality of interfaces having the highest bandwidth utilization relative to a corresponding bandwidth capacity of the selected interface;~~

~~computing a scaling factor comprising the ratio of the bandwidth capacity to the bandwidth utilization of the selected interface; and~~

computing a virtual bandwidth limit ~~by multiplying the scaling factor by the aggregate bandwidth utilization detected across the plurality of interfaces based on the capacity of each of the plurality of interfaces and the data throughput detected at the plurality of interfaces.~~

2. (currently amended) The method of claim 1 further comprising

~~configuring a bandwidth management device to enforce applying the virtual bandwidth limit across data flows traversing the interfaces, wherein the~~ ~~to a bandwidth management device is~~ operably connected to a communication path between a network and the access links.

3. (currently amended) The method of claim 1 wherein the bandwidth utilization data throughput is inbound bandwidth utilization and the virtual bandwidth limit is an inbound virtual bandwidth limit.

4. (currently amended) The method of claim 1 wherein the bandwidth utilization is outbound bandwidth utilization and the virtual bandwidth limit is an outbound virtual bandwidth limit.

5. (currently amended) The method of claim 1 further comprising
comparing the aggregate bandwidth utilization observed at the plurality of interfaces to the aggregate bandwidth utilization observed at a bandwidth management device operably connected to a communication path between a network and the access links.

6. (currently amended) The method of claim 5 further comprising
adjusting the virtual bandwidth limit based on the difference between the aggregate bandwidth utilization observed at the plurality of interfaces to the aggregate bandwidth utilization observed at a bandwidth management device operably connected to a communication path between the network and the access links.

7. (currently amended) The method of claim 5 further comprising
reducing the virtual bandwidth limit if the aggregate bandwidth utilization observed at the plurality of interfaces is greater than the aggregate bandwidth utilization observed at a bandwidth management device operably connected to a

communication path between the network and the access links.

8. (currently amended) The method of claim 5 further comprising

increasing the virtual bandwidth limit if the aggregate bandwidth utilization observed at the plurality of interfaces is less than the aggregate bandwidth utilization observed at a bandwidth management device operably connected to a communication path between the network and the access links.

9. (currently amended) The method of claim ~~[[2]]~~ 1 further comprising

comparing the computed virtual bandwidth limit to a ~~previously-applied~~ virtual bandwidth limit currently configured on a bandwidth management device, wherein the bandwidth management device is operably connected to a communication path between a network and the access links; and

configuring a bandwidth management device to implement the computed virtual bandwidth limit, if ~~wherein the applying step is conditioned on~~ the difference between the computed virtual bandwidth limit and the currently configured ~~previously-applied~~ virtual bandwidth limit does not exceed ~~exceeding~~ a threshold value.

10. (currently amended) In a computer network environment comprising plurality of access links operably connected to respective interfaces of at least one routing system, wherein the plurality of interfaces are associated with a virtual access link, a method preventing overloading any of the interfaces, the method comprising

monitoring ~~[[the]]~~ bandwidth utilization at the interfaces associated with the plurality of access links;

selecting an interface of the plurality of interfaces having the highest bandwidth utilization relative to a corresponding bandwidth capacity of the selected interface;

computing a scaling factor comprising the ratio of the bandwidth capacity to the bandwidth utilization of the selected interface; and

computing a virtual bandwidth limit for the virtual access link by multiplying the scaling factor by the aggregate bandwidth utilization detected across the plurality of interfaces based on the capacity of each of the plurality of interfaces and the bandwidth detected at the plurality of interfaces; and

utilizing applying the computed virtual bandwidth limit in controlling data flows encountered at the plurality of interfaces associated with the virtual access link.

11. (currently amended) The method of claim 10 wherein the monitored bandwidth utilization is the inbound bandwidth utilization at the interfaces; and wherein the bandwidth limit is an inbound bandwidth limit.

12. (currently amended) The method of claim 10 wherein the monitored bandwidth utilization is the outbound bandwidth utilization at the interfaces; and wherein the bandwidth limit is an outbound bandwidth limit.

13. (currently amended) A data flow control device operative to prevent overloading any given interface in a plurality of interfaces, wherein the plurality of interfaces are associated with a virtual access link, comprising

a link monitoring module operative to

monitor bandwidth utilization the load at a plurality of interfaces

associated with at least one routing system; and

compute a bandwidth limit for the virtual access link by:

selecting an interface of the plurality of interfaces having the highest bandwidth utilization relative to a corresponding bandwidth capacity of the selected interface;

computing a scaling factor comprising the ratio of the bandwidth capacity to the bandwidth utilization of the selected interface; and

multiplying the scaling factor by the aggregate bandwidth utilization detected across the plurality of interfaces

~~based on the capacity of each of the plurality of interfaces and the load detected at the plurality of interfaces; and~~

a flow control module operative to ~~apply~~ enforce the bandwidth limit in controlling data flows encountered at the plurality of interfaces associated with the virtual access link.

14. (currently amended) The data flow control device of claim 13 wherein the bandwidth utilization load is the inbound bandwidth utilization observed at the plurality of interfaces, and the bandwidth limit is an inbound bandwidth limit.

15. (currently amended) The data flow control device of claim 13 wherein the bandwidth utilization load is the outbound bandwidth utilization observed at the plurality of interfaces, and the bandwidth limit is an outbound bandwidth limit.

16. (currently amended) The data flow control device of claim 13 wherein the

bandwidth utilization load is based on the exponential weighted moving average of the inbound bandwidth utilization observed at the plurality of interfaces, and the bandwidth limit is an inbound bandwidth limit.

17. (currently amended) The data flow control device of claim 13 wherein the bandwidth utilization load is based on the exponential weighted moving average of the outbound bandwidth utilization observed at the plurality of interfaces, and the bandwidth limit is an outbound bandwidth limit.

18. (currently amended) The data flow control device of claim 13 further comprising
a traffic classification database operative to associate traffic classes to data flows;
and wherein the flow control module is operative to apply disparate bandwidth
utilization policies to data flows depending on the ~~their~~ respective traffic classes
associated with the data flows.

19. (currently amended) A system operative to prevent overloading any given interface
in a plurality of interfaces, wherein the plurality of interfaces are associated with a
virtual access link, comprising

a routing system operative to route data packets received at a given interface;
wherein the routing system comprises at least a first, second and third interface;
wherein the first and second interfaces are respectively coupled to first and second
access links; and

a data flow control device operatively connected to the routing system via the
third interface;

wherein the data flow control device comprises:

a link monitoring module operative to

monitor bandwidth utilization ~~the load~~ at the first and second interfaces;

and

compute a bandwidth limit for the virtual access link by:

selecting an interface of the plurality of interfaces having the
highest bandwidth utilization relative to a corresponding bandwidth
capacity of the selected interface;

computing a scaling factor comprising the ratio of the bandwidth
capacity to the bandwidth utilization of the selected interface; and

multiplying the scaling factor by the aggregate bandwidth
utilization detected across the plurality of interface

~~based on the capacity of, and the load detected at, the first and second interfaces; and~~

a flow control module operative to apply the bandwidth limit in controlling data flows traversing the first and second access links.

20. (currently amended) The system of claim 19 wherein the bandwidth utilization ~~load~~ is the inbound bandwidth utilization observed at the first and second interfaces, and the bandwidth limit is an inbound bandwidth limit.

21. (currently amended) The system of claim 19 wherein the bandwidth utilization ~~load~~ is the outbound bandwidth utilization observed at the first and second interfaces, and the bandwidth limit is an outbound bandwidth limit.